3GPP TSG RAN Meeting #71 **RP-160665**
Göteborg, Sweden, March 7 - 10, 2016 revision of RP-160590

Source: **Intel Corporation, ZTE**
Title: **New SID: Further enhancements to Coordinated Multi-Point Operation**
Document for: **Approval**
Agenda Item: **10.1.1**

3GPP™ Work Item Description

For guidance, see 3GPP Working Procedures, article 39; and 3GPP TR 21.900.
Comprehensive instructions can be found at http://www.3gpp.org/Work-Items

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Title: Further enhancements to Coordinated Multi-Point Operation

Acronym:

Unique identifier:

NOTE: If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

This WID includes a Core part	
This WID includes a Performance part	

1 3GPP Work Area

X	**Radio Access**
	Core Network
	Services

2 Classification of WI and linked work items

2.0 Primary classification

This work item is a …

X	**Study Item (go to 2.1)**
	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.
If you are in doubt, please contact MCC.

2.1 Study Item

Related Work Item(s) (if any]		
Unique ID	**Title**	**Nature of relationship**

Go to §3.

2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	**Title**	**Nature of relationship**

Go to §3.

2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	**Title**	**TS**

This work item is …

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

2.3.1 Stage 1

Source of external requirements (if any)		
Organization	**Document**	**Remarks**

Go to §3.

2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	**Title**	**TS**

Other source of stage 1 information		
TS or CR(s)	**Clause**	**Remarks**

If no identified source of stage 1 information, justify:

Go to §3.

2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	**Title**	**TS**

Else, corresponding stage 1 work item		
Unique ID	**Title**	**TS**

Other justification		
TS or CR(s) or external document	**Clause**	**Remarks**

If no identified source of stage 2 information, justify:

Go to §3.

2.3.4 Test spec

Related Work Item(s)		
Unique ID	**Title**	**TS**

Go to §3.

2.3.5 Other

Related Work Item(s)			
Unique ID	**Title**	**Nature of relationship**	**TS / TR**

Go to §3.

2.4 Work task

Parent Building Block		
Unique ID	**Title**	**TS**

3 Justification

4 Objective

4.1 Objective of SI or Core part WI or Testing part WI

From Rel-11, several multi-point coordination techniques were introduced to improve LTE-A system performance. However, with the recent antenna advancements, coordinating multi-point transmission schemes are essential candidates for further enhancements. For example, for the Rel-13 UEs supporting up to four receiving antennas, allowing MIMO layers to be more transmitted from different transmission points may increase the realizable MIMO transmission rank and, therefore, the user throughput performance. Such flexibility would be beneficial in the dense deployment scenarios, where the maximum MIMO transmission rank in the existing systems may be limited due to high probability of the line-of-sight propagation. Moreover, the interference in the dense deployments become more severe as there is more overlapping coverage area among the transmission points. More gains can be potentially obtained from the tight coordination schemes like joint transmission. Therefore, evaluating and identifying enhancements for multi-point coordination techniques in the dense deployment scenarios is needed. The channel and interference measurements for CSI could be another area of the enhancements, where the overhead associated with the CSI measurement resources is currently limiting factor of supporting larger number of coordinating transmission points in the dense network. Furthermore, with introduction of the more flexible beamforming support in Rel-13 FD-MIMO, support of the beam and scheduling coordination across the transmission points would become more attractive. Coordination of the transmission of the reference signals including uplink SRS (e.g. VCID) might be also useful enhancement to improve the performance in the dense deployment scenario.

4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

The main objectives of the study item is to identify and evaluate the performance benefits of the following enhancements related to coordinated multi-point schemes:

- Support of non-coherent joint transmission (JT) (e.g. support of MIMO layers transmission by the different transmission points in the single-user MIMO)

- Extension of beamforming and scheduling coordination (CS/CB) for Rel-13 FD-MIMO on the transmission points

Note 1: Evaluation should focus on the dense deployment scenarios

Note 2: For evaluation of the enhancements two and four receive antennas at UEs, 1D/2D antenna port layouts at the transmission points with ideal backhaul and non-ideal backhaul links should be considered. The study should consider both FDD and TDD.

4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:
For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.
Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the

RAN #71 #72									**Q2/2016**									**RAN**	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	89bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	90	92	79	79	79	79
										0.5									

RAN #72									**Q3/2016**									**RAN**	

#73									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
86	86	95	95	91	93	80	80	80	80
0.5									

RAN #73 #74										**Q4/2016**								**RAN**	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
86bis	86bis	95bis	95bis	91bis	93bis	80bis	80bis	80bis	80bis	87	87	96	96	92	94	81	81	81	81
0.5										**1**									

RAN #74 #75					**Q1/2017**				**RAN**
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
88	88	97	97	89	95	82	82	82	82
1									

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

additional comments to the time budget proposal:

5 Service Aspects

6 MMI-Aspects

7 Charging Aspects

8 Security Aspects

9 Impacts

Affects:	**UICC apps**	**ME**	**AN**	**CN**	**Others**
Yes		X	X		
No	X				
Don't know				X	X

10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
	Further enhancements to Coordinated Multi-Point Operation – Radio Aspects	RAN1			RAN #73	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

11 Work item rapporteur(s)

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12 Work item leadership

RAN WG1

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.
RAN WG4 is by default leading the Perf. part.

13 Supporting Individual Members

Supporting IM name
ASTRI
ASUSTeK
CEWiT
CATR
China Mobile
China Telecom
China Unicom
Coolpad
IAESI
IITH
Intel Corporation
InterDigital
ITL
ITRI
KT Corporation
LG Electronics
Mediatek
NEC
Nubia Technology
Reliance – Jio
Samsung
Shanghai Tejet Com Technology
SK Telecom
WILUS Inc
Xinwei
ZTE